Supplemental Material

Adverse Health Effects of Child Labor: High Exposure to Chromium and Oxidative DNA Damage in Children Manufacturing Surgical Instruments

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Supplemental Material, Table S1: Correlation coefficient of urinary metals (corrected for creatinine) in the entire study population (n=168)

	Al	V	Cr	Mn	Co	Ni	Cu	Zn	As	Se	Mo	Cd	Ba	Pb	U
Al	1														
V	0.53	1													
Cr	0.42	0.55	1												
Mn	0.66	0.71	0.40	1											
Co	0.45	0.45	0.34	0.38	1										
Ni	0.57	0.72	0.60	0.57	0.74	1									
Cu	0.55	0.56	0.42	0.58	0.55	0.69	1								
Zn	0.29	0.30	0.08	0.36	0.39	0.41	0.58	1							
As	0.37	0.34	0.20	0.30	0.53	0.50	0.58	0.44	1						
Se	0.46	0.45	0.38	0.35	0.63	0.67	0.70	0.52	0.66	1					
Mo	0.32	0.43	0.42	0.24	0.52	0.66	0.48	0.29	0.45	0.61	1				
Cd	0.46	0.48	0.25	0.36	0.59	0.65	0.64	0.45	0.63	0.65	0.78	1			
Ba	0.34	0.47	0.02	0.57	0.23	0.29	0.41	0.49	0.22	0.22	0.16	0.28	1		
Pb	0.56	0.42	0.16	0.54	0.44	0.49	0.58	0.43	0.51	0.44	0.32	0.57	0.40	1	
U	0.28	0.47	0.28	0.58	0.25	0.40	0.51	0.49	0.33	0.35	0.29	0.31	0.55	0.36	1

p-value for the correlations between all metals is significant, except for Cr vs. Zn (p=0.2) and Cr vs. Ba (p=0.7).

Supplemental Material, Table S2: Principal component loadings of the variables

Metal	Correlations
Aluminum	0.68
Vanadium	0.81
Chrome	0.72
Manganese	0.74
Nickel	0.88
Copper	0.79
Molybdenum	0.69
Cadmium	0.72
Tin	0.63
Antimony	0.78
Uranium	0.56

The composite exposure index (principal component 1) obtained by the first component of a principal components analysis of the urinary concentration of 11 metals (Al, V, Cr, Mn, Ni, Cu, Mo, Cd, Sn, Sb, and U) explained 54% of total variance (eigenvalue 5.97). The results of principal component were significantly higher in the group of working children (explained 27% of the variance).

Supplemental Material, Table S3: Change in health outcome for a doubling in metal concentrations and for 1 unit change in composite metal exposure index

Characteristics	Cr	Ni	As	Cd	Exposure index[a]
Systolic BP – mmHg	0.27 (-0.10 to 0.65)	0.57 (-0.75 to 1.90)	1.43 (-0.30 to 3.17)	0.91 (-0.58 to 2.41)	0.37 (-0.14 to 0.89)
Diastolic BP – mmHg	0.07 (-0.33 to 0.47)	-0.08 (-1.50 to 1.33)	0.63 (-1.23 to 2.50)	0.08 (-1.51 to 1.70)	0.03 (-0.51 to 0.59)
FVC – L	0.07 (0.04 to 0.10)**	0.03 (-0.11 to 0.18)	-0.09 (-0.29 to 0.09)	-0.02 (-0.18 to 0.13)	0.02 (-0.01 to 0.06)
FEV1 – L	0.06 (0.04 to 0.09)**	-0.004 (-0.12 to 0.11)	-0.15 (-0.31 to 0.005)	-0.05 (-0.18 to 0.07)	0.01 (-0.01 to 0.04)
FEV1/FVCx100	0.001 (-0.44 to 0.44)	-1.32 (-3.20 to 0.54)	-2.52 (-4.93 to -0.11)*	-1.45 (-3.46 to 0.55)	-0.15 (-0.35 to 0.04)
Physician Reported Asthma	1.22 (0.98 to 1.51)	0.67 (0.34 to 1.30)	0.75 (0.34 to 1.85)	0.56 (0.24 to 1.30)	1.04 (0.80 to 1.34)
8-OHdG	1.03 (0.99 to 1.07)	1.40 (1.23 to 1.61)**	1.13 (0.92 to 1.40)	1.22 (1.05 to 1.43)*	0.05 (0.03 to 0.07)**

§The data is mentioned as regression coefficients or odds ratios (asthma) with 95% CI for a doubling in the urinary metal concentration (µg/g creatinine). Regressions with systolic and diastolic BP adjusted for age; with FVC and FEV1 adjusted for height; 8-OHdG adjusted for age, height, and weight.

[a] Changes for 1 unit increase in exposure score (principal component), obtained as described in Supplemental Table S2.

*$p<0.05$
**$p<0.0001$